

U.S. Patent Application
Serial No. 10/532,686

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ATTACHMENT A

Claims 1-27: (Cancelled)

28. (New) Butene-1 copolymers comprising a content up to 40% by mol of at least one comonomer, the comonomer being selected from ethylene, propylene, or mixtures thereof, the butene-1 copolymers further comprising:

- a) a product of the reactivity ratios $r_1 \cdot r_2 \leq 1.5$;
- b) a content of butene-1 units in form of isotactic pentads (mmmm) > 98.5%; and
- c) an absence of 4,1 insertions of butene units.

29. (New) The butene-1 copolymers according to claim 28, wherein the content of (mmmm) is >99% and the reactivity ratio $r_1 \cdot r_2 \leq 1$.

30. (New) The butene-1 copolymers according to claim 28 further comprising a PI ranging from 3-10.

31. (New) The butene-1 copolymers according to claim 28, wherein the content of the at least one comonomer ranges from 0.1 to 35% by mol.

32. (New) The butene-1 copolymers according to claim 31, wherein the content of the at least one comonomer ranges from 0.5 to 30% by mol.

33. (New) The butene-1 copolymers according to claim 32, wherein the at least one comonomer is ethylene.

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34. (New) The butene-1 copolymers according to claim 32, wherein the at least one comonomer is propylene.

35. (New) The butene-1 copolymers according to claim 28, wherein the content of the at least one comonomer is lower than about 3% by mol.

36. (New) The butene-1 copolymers according to claim 32, wherein the content of the at least one comonomer ranges from 2-15% by mol.

37. (New) The butene-1 copolymers according to claim 28, wherein the content of the at least one comonomer is at least 12% by mol.

38. (New) The butene-1 copolymers according to claim 37, wherein the comonomer is ethylene.

39. (New) The butene-1 copolymers according to claim 37, wherein the butene-1 copolymers do not show a melting point at the thermal analysis.

40. (New) A polymer composition comprising: (A) from 1 to 99wt % of a butene-1 copolymer comprising a content up to 40% by mol of at least one comonomer, the comonomer being selected from ethylene, propylene, or mixtures thereof, the butene-1 copolymers further comprising:

- a) a product of the reactivity ratios $r_1 \cdot r_2 \leq 1.5$;
- b) a content of butene-1 units in form of isotactic pentads (mmmm) > 98.5%; and

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c) an absence of 4,1 insertions of butene units;
and (B) from 1 to 99% of another polymeric component the said percentages being referred to the sum of (A) and (B).

41. (New) The polymer composition according to claim 40, wherein the component (B) comprises an olefin (co)polymer.

42. (New) The polymer composition according to claim 40, wherein the component (B) is an ethylene containing (co)polymer, a propylene containing (co)polymer, or mixtures thereof.

43. (New) A polymer composition comprising:

(A) from 5 to 40%wt of butene-1 copolymers comprising from 1 to 15% by mol of ethylene, propylene, or mixtures thereof, the butene-1 copolymers further comprising:

- a) a product of the reactivity ratios $r_1 \cdot r_2 \leq 1.5$;
- b) a content of butene-1 units in form of isotactic pentads (mmmm) > 98.5%; and
- c) an absence of 4,1 insertions of butene units;
and

(B) from 60 to 95%wt of a propylene copolymer comprising from 1 to 30 % by mol of at least one comonomer, the comonomer being selected from ethylene and an α -olefin of formula $\text{CH}_2=\text{CHR}$, wherein R is a $\text{C}_2\text{-C}_{10}$ hydrocarbon group.

44. (New) The polymer composition according to claim 43, wherein said α -olefin is butene-1.

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45. (New) The polymer composition according to claim 43, wherein the component (B) is selected from either (a) a propylene copolymer comprising both ethylene and butene-1, wherein the content of ethylene is from 1 to 10% by mol and the content of butene-1 is from 1 to 10% by mol, or (b) a propylene copolymer containing from 2 to 15% by mol of butene-1.

46. (New) A polymer composition comprising: (A) a butene-1 copolymer comprising a content up to 40% by mol of at least one comonomer, the comonomer being selected from ethylene, propylene, or mixtures thereof, the butene-1 copolymers further comprising:

- a) a product of the reactivity ratios $r_1 \cdot r_2 \leq 1.5$;
- b) a content of butene-1 units in form of isotactic pentads (mmmm) > 98.5%;
- c) an absence of 4,1 insertions of butene units; and
- d) not showing a melting point; and

(B) a butene-1 copolymer comprising a content up to 40% by mol of at least one comonomer, the comonomer being selected from ethylene, propylene, and mixtures thereof, the butene-1 copolymers further comprising:

- a) a product of the reactivity ratios $r_1 \cdot r_2 \leq 1.5$;
- b) a content of butene-1 units in form of isotactic pentads (mmmm) > 98.5%;
- c) an absence of 4,1 insertions of butene units; and
- d) showing a melting point.

47. (New) The polymer composition according to claim 46, wherein (A) is a butene-1/ethylene copolymer comprising a

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content of ethylene of higher than 10% by mol; and (B) is a butene-1/ethylene copolymer comprising a content of ethylene of less than 10% by mol.

48. (New) A polymer composition comprising:

(i) from 5 to 25% wt of a butene-1 copolymer comprising a content up to 40% by mol of at least one comonomer, the comonomer being selected from ethylene, propylene, or mixtures thereof, the butene-1 copolymers further comprising:

- a) a product of the reactivity ratios $r_1 \cdot r_2 \leq 1.5$;
 - b) a content of butene-1 units in form of isotactic pentads (mmmm) > 98.5%; and
 - c) an absence of 4,1 insertions of butene units;
- and

(ii) from 75 to 95%wt of an ethylene polymer; said percentages being based on the sum of (i)+(ii).

49. (New) Manufactured articles obtained from a composition comprising at least one butene-1 copolymer comprising a content up to 40% by mol of at least one comonomer, the comonomer being selected from ethylene, propylene, or mixtures thereof, the butene-1 copolymers further comprising:

- a) a product of the reactivity ratios $r_1 \cdot r_2 \leq 1.5$;
- b) a content of butene-1 units in form of isotactic pentads (mmmm) > 98.5%; and
- c) an absence of 4,1 insertions of butene units.

50. (New) A process for preparing butene-1 copolymers comprising a content up to 40% by mol of at least one

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comonomer, the comonomer being selected from ethylene, propylene, or mixtures thereof, the butene-1 copolymers further comprising:

- a) a product of the reactivity ratios $r_1 \cdot r_2 \leq 1.5$;
 - b) a content of butene-1 units in form of isotactic pentads (mmmm) > 98.5%; and
 - c) an absence of 4,1 insertions of butene units,
- the process comprising copolymerizing butene-1 and at least one comonomer, the comonomer being selected from ethylene, propylene, and mixtures thereof, in presence of a stereospecific catalyst comprising (A) a solid catalyst component comprising a Ti compound of formula $Ti(OR)_{n-y}X_y$, where $n=4$; X is a halogen; and y is a number from 1 to n, and an electron-donor compound selected from phthalates, supported on $MgCl_2$; (B) an alkylaluminum compound; and (C) an external electron-donor compound of formula $R_a^5R_b^6Si(OR^7)_c$, wherein $a=0$ and $b=1$; c is 3; and R^6 is a branched alkyl or cycloalkyl group optionally comprising at least one heteroatom; and R^7 is methyl.

51. (New) The process according to claim 50, wherein the external donor is hexyltrimethoxysilane.

52. (New) The process according to claim 50, wherein the process is carried out in liquid butene-1.

53. (New) The process according to claim 52, wherein the process is carried out in at least two reactors working under different reaction conditions.